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P. O. Box 111, Room 931
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Subject: Response to Comments by the Utah Chapter Sierra Club, et al. on NO_x Emissions from the Intermountain Generating Station (IGS)

Dear Jim:

As requested by your staff, I have reviewed the following documents: (1) "Intermountain Power Project and NO_x Controls" by Howard Wilkerson, from the June-July 1983 issue of Uinta News (a publication of the Utah Chapter Sierra Club), and (2) the 20 April 1983 letter from the Utah Chapter Sierra Club, five other environmental organizations and one individual to the Utah Air Conservation Committee entitled "Intermountain Power Project and Selective Catalytic Reduction Technology." Among the major issues identified in one or both of the documents are the contentions that: (1) no dispersion model calculations of the air quality impact of emissions of oxides of nitrogen (NO_x) have ever been performed for the Intermountain Generating Station (IGS), (2) stationary source NO_x emissions in the State of Utah will be doubled by the addition of the NO_x emissions from the two-unit IGS as currently designed, (3) the NO_x emissions from the IGS will contribute to the current problem of non-attainment with some of the National Ambient Air Quality Standards (NAAQS) along the Wasatch Front, and (4) the NO_x emissions from the IGS will form a visible brown plume that will extend 20 miles or more downwind, depending on the meteorological conditions, in an area of high visibility. My comments on these four issues are given below. I point out that my comments are restricted to my areas of expertise and do not address issues such as the feasibility of various types of emission control technologies.

Issue (1)

All of the H. E. Cramer Company's dispersion model analyses of the air quality impact of emissions from the IGS (identified as the IPP Power Plant in our earliest reports) have included calculations of nitrogen dioxide (NO_2) concentrations (Bowers, et al., 1978a; Bowers, et al., 1981; and Bowers, et al., 1983). For example, under the assumption that all NO_x molecules are immediately converted to NO_2 as they exit the

stack, Figure 3-2 of our report on the current two-unit version of the IGS (Bowers, et al., 1983) shows that the calculated maximum annual average ground-level NO_2 concentration attributable to emissions from the IGS of 4.3 micrograms per cubic meter occurs 7.1 kilometers north-northeast of the IGS stack. This maximum annual NO_2 concentration is a small fraction of the primary and secondary annual NAAQS for NO_2 of 100 micrograms per cubic meter.

Based on the air quality data available from the Utah Bureau of Air Quality (UBAQ), the highest annual NO_2 concentrations in the State of Utah of about 60 micrograms per cubic meter are found in the Wasatch Front cities of Provo and Salt Lake. These concentrations are primarily attributable to emissions from mobile sources along the Wasatch Front. In our air quality impact analysis for the original four-unit version of the IGS (Bowers, et al., 1978a), we concluded that there will be negligible interactions of emissions from the IGS with emissions from the mobile and stationary sources along the Wasatch Front because the IGS and the Wasatch Front are contained in different functional air basins. In other words, it is our opinion that it will be impossible to measure the effects of NO_x emissions from the IGS in the Wasatch Front area because the NO_x concentrations attributable to emissions from the IGS will be negligible.

Issue (2)

According to the article by Mr. Wilkerson, NO_x emissions from the current two-unit IGS "will approximately double the stationary source (as opposed to mobile sources such as cars) of NO_x emissions in Utah." To the best of our knowledge, this statement is based on erroneous or out-of-date information. According to the information provided to the H. E. Cramer Company for use in the air quality impact assessment that is contained in the Final Environmental Impact Statement for the expansion of the Emery (Hunter) Power Plant (Bowers, et al., 1978b), current NO_x emissions from only Hunter Units 1, 2 and 3 in combination with current NO_x emissions from Units 1 and 2 of the nearby Huntington Canyon Power Plant exceed the NO_x emissions that will result from the operation of the two-unit IGS by a factor of about 1.3. There are, of course, stationary sources of NO_x emissions in the State of Utah in addition to the Hunter and Huntington Canyon Power Plants. Thus, the NO_x emissions from the two-unit IGS will not double the stationary source NO_x emissions in Utah.

Issue (3)

We expect that NO_x emissions from the IGS will have the same negligible impact on the air quality in the Wasatch Front area as the

impact of the NO_x emissions from the Hunter and Huntington Canyon Power Plants. Based on our examination of the NO_2 air quality data tabulated by the UBAQ for the Wasatch Front cities of Provo and Salt Lake, we are unable to discern any effects of the increases in stationary source NO_x emissions as Hunter Units 1, 2 and 3 and the second Huntington unit (Unit 1) came on line during the late 1970's and early 1980's. For example, the annual average NO_2 concentrations in Salt Lake City and Provo were constant during the period 1979 through 1982. To illustrate that the effects on NO_2 air quality in the Wasatch Front area of emissions from these two power plants are negligible in comparison with the effects of emissions from local mobile and stationary sources and the effects of year-to-year variations in meteorological conditions, the highest and second-highest hourly NO_2 concentrations measured in Provo and Salt Lake City during 1981 were lower than during 1980.

The letter from the Sierra Club, et al. expresses a concern about the fact that the Wasatch Front area currently is not attaining some of the NAAQS (40 CFR 52.2331). However, we point out that the entire State of Utah is an attainment area for the NO_2 NAAQS. Even if the maximum ground-level NO_2 concentration estimated at any point for emissions from the two-unit IGS is added to the maximum NO_2 concentration measured in the State of Utah, the resulting concentration is well below the NAAQS. Additionally, because of the negligible NO_x concentrations that we expect along the Wasatch Front as a result of emissions from the IGS, we expect that emissions from the IGS will produce negligible contributions to the concentrations in the Wasatch Front area of photochemical air pollutants such as ozone (O_3).

Issue (4)

Mr. Wilkerson's article concludes that, "Finally, the NO_x will be visible, depending on the weather, as a brown plume twenty or more miles long in a region which now has high visibility." Based on the available data, the Delta area does not have "high visibility" in comparison with the pristine air quality areas of Utah. The mean visual range (maximum distance at which an object can be seen) at the Delta, Utah Airport during the period 1949 through 1954 (the most recent period for which visibility observations are available) was only about 70 kilometers (Bowers, 1979). This visibility is much less than the 170-kilometer regional visual range estimated for Utah by Latimer and Ireson (1980, Figure 13). Our analysis of the Delta Airport hourly surface weather observations indicated that wind-blown dust, probably attributable to agricultural activities, was the primary cause of the relatively poor visibility in the Delta area.

Whether the plume from the IGS will be visible will depend on the background illumination, the plume constituents and dimensions, and the relative position of the sun, plume and observer. The brown plume described in Mr. Wilkerson's article assumes that the NO_2 concentration in the IGS plume is sufficiently high that enough blue light is selectively absorbed to produce a discernible discoloration. Although we have not evaluated the potential visibility impacts of emissions from the IGS within 20 miles of the IGS plant site, we have evaluated the visibility impacts at the nearest existing and potential Class I (pristine air quality) areas of emissions from the original four-unit IGS configuration (Bowers, 1979). The results of our model calculations indicated that there will be no detectable atmospheric discolorations or reductions in the visual range attributable to these emissions.

I hope that the above comments help to place in perspective the concerns expressed in Mr. Wilkerson's article and in the Sierra Club, *et al*. letter.

Sincerely,

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Principal Scientist

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